Vol. 3

NELP
Navy Environmental Leadership Program
bulletin

July 99

SPECIAL P2 EDITION

OUR MISSION

The Navy Environmental Leadership Program (NELP) was established to find new and innovative ways to manage Navy environmental programs. It includes an East Coast base at Naval Station (NS) Mayport and a West Coast base at Naval Air Station North Island (NASNI) within Navy Region Southwest.

The NELP mission includes testing new technologies and management strategies and then sharing successes throughout the Navy and Marine Corps family. NELP's ultimate goal is to preserve the environment and reduce cost and labor. One important tool for reaching that goal is pollution prevention (P2).

P2 has been a key element of NELP since the program's inception in 1993. To help focus more attention on P2 opportunities, NS Mayport NELP created a P2 Quality Management Board (QMB). This QMB is currently evaluating many P2 initiatives including an improved stenciling and marking system for use aboard ship and a VOC-free enzyme bioremediating parts washer.

NELP's P2 effort is enhanced by a partnership with the Chief of Naval Operations' Pollution Prevention Equipment Program (PPEP), which field tests new P2 technologies. Through this partnership, PPEP supplies prototype equipment for testing at the NELP bases. The lessons learned from those activities are then shared with other Navy activities.

P2 remains a top priority for NELP. This special P2 Edition NELP Bulletin, highlights some of the initiatives.

NAVSEASYSCOM EXPLORES NELP DESCALING INITIATIVE

The Navy Environmental Leadership Program (NELP) recently arranged for the Naval Sea Systems Command (NAVSEASYSCOM) OOT Working Group to observe the benefits of using an alternative descaling agent to clean a sea water heat exchanger aboard USS Underwood (FFG-36), and to explore the possibility of authorizing Sailors to use this material shipboard. Currently permission is granted only to contractors for use aboard ship. The Shore Intermediate Maintenance Activity (SIMA) Mayport uses it ashore.

The descaling agent has been used to remove scale, lime and shells from heat exchangers, coolers and piping aboard USS Philippine Sea (CG-58) and USS Gettysburg (CG-64). It has also been effective in cleaning the Collection, Holding and Transfer (CHT) system aboard USS John Hancock (DD-981).

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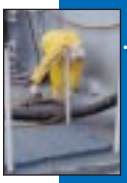
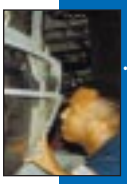
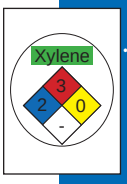
A Sneak Preview at what's inside this issue...







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Performing cleanings aboard ship instead of ashore will provide significant cost savings to the Navy. Previously, coolers and heat exchangers had to be removed from ships and brought to SIMA for cleaning. Depending on the type of equipment and the amount of debris to be removed, the procedure could require as many as seven personnel working up to 20 days. In addition, repair parts could cost more than $3,000 and other repair costs could exceed $60,000.

LCDR Mark Solberg (SIMA Mayport) shows Darryl Sheedlo (NAVSEASYSCOM) and Ben Zlateff (NAVSEASYSCOM) a heat exchanger to be cleaned with the descaling agent at SIMA.

Comparatively, cleaning equipment in place on the ships requires one person to perform the procedure, which takes about four hours, and parts do not have to be repaired.

"The process is very quick, very easy and very unobtrusive," said Lt. James Fleming, Underwood's Engineer Officer.

The process is much safer than the heated sulfamic acid previously used aboard ships and at SIMA. The descaling agent is a mild acid that is biodegradable, non-flammable, and has an optimum cleaning temperature of 50 to 70 degrees Fahrenheit. However it maybe used at any temperature within the operating limits, between 0 to 180 degrees Fahrenheit.

The liquid is mixed with equal parts fresh water in a 20-gallon tank before use. It is recirculated through the heat exchanger or other ship components using a small pump until the system is clean. It is neutralized on board ship and then discharged into a pierside storage tank for proper removal and disposal.

NAVSEASYSCOM will continue to evaluate this alternative descaling agent and its benefits before making a final determination on authorization for Sailors to use it aboard ship.

For more information on NELP or the use of this process aboard ship, contact LCDR Joseph Campisano at (904) 270-5435 (DSN 960) or e-mail jcampisano@sermc.spear.navy.mil

Heat exchanger before cleaning with the descaling agent.

Heat exchanger after cleaning with the descaling agent.

NELP GETS FEEDBACK FROM THE NAVY COMMUNITY AT PAINTING TECHNOLOGIES DEMONSTRATION

The Navy Environmental Leadership Program's (NELP) Pollution Prevention (P2) Quality Management Board (QMB) recently invited members of Naval Station (NS) Mayport's departments to a demonstration to provide input on the validity and potential uses of three technologies. Other guests included representatives from Naval Surface Warfare Center Carderock and Commander-in-Chief, Atlantic Fleet.

"It is important to involve the end-users early in the process," P2 QMB Team Leader Bob Tierney said. "Their comments and questions help us to identify good demonstration sites for the equipment, and they provide direction to ensure that we do not waste time or resources on something that has no real application or makes their job harder."

The first innovative technology demonstrated was an airless spray paint gun that gives a user the control to divert overspray downward. Next, attendees observed a high volume/low pressure (HVLP) spray

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NELP TECHNOLOGY GETS AN A+

The Navy Environmental Leadership Program (NELP) Pollution Prevention (P2) Quality Management Board (QMB) demonstrated a dry-steam cleaning unit at Naval Station (NS) Mayport.

The steam cleaning unit converts distilled or deionized water into dry steam at a working pressure of 300 pounds per square inch (psi). The steam is sent through a wand and can be used to clean a wide variety of parts. A major benefit of the cleaner is that parts do not need to be taken apart before they are cleaned, and no solvents are necessary. At the demonstration, participants cleaned small electronic circuit boards, a 9-mm pistol, an M-16 rifle, an exhaust fan, an oil drip pan, a Close-In Weapons System (CIWS) motor, and a front-end loader. "My mind is just spinning with all the different things I could clean with this unit," said Petty Officer Bruce Grimes of Helicopter Anti-Submarine Squadron 42.

Petty Officer Beck (SIMA Mayport) uses the dry-steam cleaning unit to clean a Close-In Weapons System (CIWS) motor.

The steam dries virtually on contact with the parts and leaves no residue. The cleaner is considered safe for users because it only heats a small amount of liquid at any given time.

Petty Officer McCullough (NS Mayport Small Arms Range) cleans an M-16 rifle with the dry-steam cleaning unit.

"I give it an A+," Grimes said after using the unit. "We usually use aircraft soap to clean cracked drip pans before we patch them. Sometimes the oils from the soap leave a residue that causes the patches to peel up. With this unit, I would not need to worry about patches peeling." He added that the unit would also save man-hours because he would not have to wait for the drip pans to dry before working on them.

Petty Officer Simpson (AIMD Mayport) cleans a circuit board with the dry-steam cleaning unit.

Chief Richard Huey of Shore Intermediate Maintenance Activity (SIMA) Mayport also commented on the efficiency of the steam cleaner after observing a Sailor use it to clean a greasy CIWS motor. "Normally we would have to let the motor soak overnight before we could clean it," Huey said.

The steam cleaner is operated by hand controls on the wand base or the main unit. A variety of different shaped wand nozzles and hose lengths are available for added versatility. The cleaner comes in various sizes ranging from a 17-pound portable unit to a four-chambered unit on a six-foot hooded cart.

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The only wastes associated with the cleaner are those removed from the parts being cleaned. This minimal waste is easy to capture, and the reduced volume results in lower disposal costs. To illustrate the disposal cost savings, the manufacturer of the cleaner explained that if parts were cleaned with traditional solvents and generated four 50-gallon drums of waste, those drums would cost approximately $1,140 to remove. In comparison, the same parts could be cleaned with the dry-steam cleaning unit, generating two absorbent blankets-full of waste that would cost only a few dollars to remove.

Spectators at the NS Mayport Weapons Center Small Arms Range were also interested in the rust inhibitor that can be added to the water for the unit. The additive leaves no residue and dries on contact.

Based on the overwhelmingly positive response from the commands that viewed the demonstration, NELP plans to purchase the units for their use.

For more information on NELP or the dry-steam cleaning unit, contact Ursula Shaw at (904) 270-6730 ext. 21 (DSN 960) ushaw@nsmayport.spear.navy.mil or LCDR Mark Solberg at (904) 270-5126 ext. 3047 (DSN 960) msolberg@sermc.spear.navy.mil.

NELP supports RSG Mayport in a Paint Removal technology demonstration aboard USS Boone

A waterjet blast system was used to remove paint from the foc'sle of USS Boone (FFG-28) in a demonstration organized by Naval Surface Atlantic Port Engineer Shawn Sullivan. The waterjet system is solvent free, uses water as its only blasting medium, produces less noise and waste, and is estimated to cost less than traditional sand blasting.

The vendor demonstrates the waterjet blast system on the foc'sle of USS Boone (FFG-28).

The system forces water through rotating heads in the nozzle at high pressures, and the head pressure can be adjusted to give a user flexibility in stripping paint. During the stripping operations, the blasting water and stripped paint are vacuumed and collected in a containment truck on the dock.

"What really makes this system great is that it is a clean product," retired CAPT Bill Earnest said. "It does not produce the dust and debris usually associated with sand blasting, which means less cleanup. Plus it works better."

The rusted flange before cleaning with the waterjet blast system.

Dust from sand blasting tends to interrupt other nearby operations and forces them to be postponed. Because the waterjet creates no dust, other work can be performed in close proximity. The dust reduction also addresses health and safety issues. Because there is no blasting media, a user is not required to wear a blasting suit.

The waterjet blast system easily cleans a rusted flange to the white metal aboard USS Boone (FFG-28).

The system is expected to provide savings in both labor and hazardous waste disposal costs because it reduces the amount of hazardous waste generated. Another cost saving is in the

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system's flexibility. It can be adapted for removing large areas of paint or for spot maintenance. The system also works in hard-to-reach areas such as curves, ledges, and bolts, which would otherwise require the use of a needle gun.

The system performed well in the demonstration, and the audience seemed impressed with it. Some called it the wave of the future. "It will make life a lot easier for the Sailors because of the reduction in labor and noise," CDR John Ordemann said.

A dockside high-pressure water pump truck serves the waterjet blast system.

The Navy Environmental Leadership Program (NELP) plans to gather feedback on the system and will share the lessons learned throughout the Naval

The waterjet blast system easily removes non-skid coating without the use of blasting media or solvents.

community.

For more information on NELP or the waterjet system, contact LCDR Joseph Campisano at (904) 270-5435 (DSN 960) or e-mail jcampisano@sermc.spear.navy.mil

NS Mayport's Helicopter Support Team Tests Sealant

In a move to reduce hazardous waste and costs associated with the management of it, Naval Station Mayport's Detachment Multi-Mission Helicopter In-Service Support Team members are testing a gasket material made from Teflon to replace the polysulfide caulking currently used for aircraft sealing applications.

The gasket is a variety of expanded polytetraflouroethylene designed for aircraft sealing applications. Gaskets made from the non-hazardous, durable and reusable material have no special disposal requirements. As such, they are an attractive alternative to the polysulfide sealants, which are not reusable and are classified as hazardous waste when disposed.

"We are using the gaskets under the floorboards, around any access panels that are removed on a regular basis, and around the windshields," Naval Aviation Depot Cherry Point employee and H-60 Structures On-Site Engineer Myles Colley said.

According to Colley, the primary reason for using the new material is to eliminate the generation of waste such as polysulfide, which can be costly to manage due to its hazardous waste classification. "Hazardous waste restrictions and disposal costs are running up the costs of doing business," Colley said. "We are trying to reduce costs wherever we can."

When dried polysulfide caulking is removed from an aircraft, it must be disposed of as hazardous waste. In addition, less than one ounce of a six-ounce tube of polysulfide caulking is usually used when repairing the seals; and because the tubes are not resealable, the remainder of the product must also be disposed of as hazardous waste. In contrast, removing or repairing the Teflon gasket generates no hazardous waste because its adhesive is not hazardous.

Another advantage of using the Teflon gaskets is a reduction in the man-hours required for aircraft maintenance and repair. The support team removes access panels every 28 days and floorboards every 112 days. This routine maintenance destroys the polysulfide seals and requires a lengthy process of removing the residual polysulfide with a non-metallic scraper, cleaning the surface and applying new sealant.

With the Teflon gaskets, much of this process is eliminated because they are reusable. In addition, seal repairs are less frequent because the gaskets are more durable and do not deteriorate as quickly as polysulfide when exposed to solvents or hydraulic fluid.

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As opposed to polysulfide seals, if the Teflon gaskets are damaged, repairs can be made to isolated areas, and damaged areas can simply be removed, cleaned and replaced. Reapplication of the gaskets is also a much easier process because the adhesive bond is not crucial; the gaskets are mainly held in place by bolt fasteners or the compression of the two surfaces being sealed. Colley estimates that after the new gaskets are installed, approximately 540 man-hours per aircraft could be saved on maintenance and repair per year.

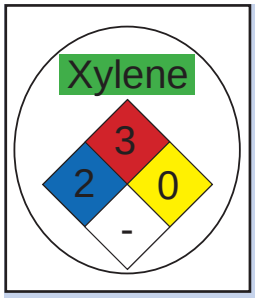
Naval liaison Bruce Warren prepares to replace a helicopter observation window after applying the Teflon gasket.

While up-front material costs for the Teflon gaskets are approximately 40 percent higher than those of the polysulfide sealant, the product is more cost effective when factors such as the elimination of hazardous waste, reduction of maintenance materials and reduction of maintenance man-hours are considered.

"Cost comparison over a five-year maintenance cycle shows savings of $150,000 to $200,000," Colley said. "This cost is based on using the gaskets on all removal panels, floorboards and windows. The current evaluation will determine the feasibility of using this product on all panels or just a portion of the aircraft. These figures are based on man-hours and materials and are independent of any additional savings that would occur due to the elimination of hazardous waste."

For more information about the Teflon gaskets or NELP contact
LT Rob Kalin at (904) 270-6430 or e-mail kalinr@chslwl.spear.navy.mil.

NELP LEARNS LESSONS ON AN ALTERNATIVE MOTOR REWIND VARNISH



When an electric motor burns out, the copper wire coil and electrical plugs must be replaced through a process known as rewinding. After the motor is rewound, it must be varnished to insulate the wire from the motor casing and prevent arcing. Until recently, motors were dipped in a varnish containing xylene and then baked to harden the varnish. However, shipboard concerns arose about the potential fire-hazard posed by using varnish, which contains 28 percent naphtha (a petroleum product) and 20 percent xylene. As a result, varnishes without xylene were investigated for implementation both aboard ships and ashore.

A varnish without xylene was tested for three months at the Shore Intermediate Maintenance Activity (SIMA), Naval Station Mayport, Florida. Later, the motor rewind function for ships at NS Mayport was relocated to the Trident Refit Facility (TRF) in Kings Bay, Georgia, where the test was continued.

The alternative varnish, which contains diallyl phthalate, dicunyl peroxide, and formaldehyde, was used in a dip tank at SIMA. A pump was attached to the dip tank for coating motors that were too large for full immersion.

The following are the lessons learned at SIMA:

- Varnish dries more quickly when it does not contain xylene, reducing total process time.
- The alternative varnish eliminates the xylene, which is a listed hazardous air pollutant (HAP), and has

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paint gun capable of spraying high solids paint, such as marine coatings. The third technology presented was a portable vacuum system that captures overspray from a HVLP paint gun and cycles it through a series of filters to remove particulates.

The vendor prepares the high solids paint for use in the HVLP paint gun.

Chief Petty Officer Roger Jewell of the Aviation Intermediate Maintenance Department (AIMD) at NS Mayport immediately recognized an application for the vacuum system. He believed it would be useful in the hangar bay of carriers during corrosion control painting of the aircraft and ground support equipment. Painting and sanding are often done concurrently in close proximity but there are problems with the sanding debris getting in the paint.

Jewell suggested that if the technology could be used to vacuum the sanding debris while it was being done in the hangar bay, it would make the job easier by allowing both processes to occur concurrently.

NELP Coordinator Ursula Shaw also approached Commodore Lenhouts, Commander Strike Fighter Wing Atlantic, and the maintenance staff at Naval Air Station Cecil Field for their feedback on the capabilities of the technology and they agreed it was worth further investigation. "As one of the end-users aboard USS John F. Kennedy, everyone was extremely enthusiastic about the potential of the vacuum system and offered to test an additional prototype in their hangar," said Shaw.

Ursula Shaw (NELP Coordinator) and David Cabiness (Southern Division Naval Facilities Engineering Command) examine the portable vacuum system.

As a result of the interest and the potential uses both afloat and ashore, NELP will conduct further analysis of the technologies evaluated and is drafting a proposal for a test site of the vacuum system at Mayport.

For more information on NELP or the technologies mentioned here, please call Chief Petty Officer Roger Jewell at (904) 270-6651 or 270-6652 (DSN 960) or email rjewell@nsmayport.spear.navy.mil.

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a higher flash point and is less flammable than varnish with xylene.

- Varnish without xylene can only be used on new or rewound motors. It will not adhere to motors previously dipped in xylene varnish.
- Because varnish without xylene dries quicker and becomes more viscous, it can cause pump failure in the dip tanks.
- While the alternative varnish contains formaldehyde, it is present at such low concentrations that respiratory personal protection equipment (PPE) is not required.
- Additional training is required for personnel to use the varnish without xylene.
- Each process using xylene, a HAP, must be individually listed, and quantities tracked and reported to meet Title V permit requirements.
- Because varnish without xylene breaks down over time, the dip tank must be flushed every 6 months and the used material placed in drums and disposed of as hazardous waste.

Personnel at TRF Kings Bay use the varnish without xylene on a limited basis due to concerns that it does not adhere to previously rewound motors.

For more information on NELP or the varnish without xylene, contact LCDR Mark Solberg at (904) 270-5126 ext. 3047 (DSN 960) or email msolberg@sermc.spear.navy.mil.

P2 Equipment aboard ships -
from prototype to implementation

Naval Surface Warfare Center (NSWC) Carderock will install five pieces of equipment on USS John F. Kennedy (CV-67) as part of its Jump-Start program. USS John F. Kennedy personnel requested that NSWC Carderock only install mobile equipment at this time because they are preparing for deployment. The mobile equipment to be installed includes:

- HVLP paint guns
- Maintenance-free batteries
- Cable lubricators
- Paint gun cleaners
- Mercury ion exchange cartridges

The remaining fixed equipment will be installed at a later date. Some of the equipment to be implemented under the Jump-Start program was prototyped onboard USS John Hancock (DD-981) with the support of the Navy Environmental Leadership Program (NELP).

For more information on NELP or the equipment mentioned here, please call Cheryl Mitchell at (904) 270-6730 ext. 11 (DSN 960) or e-mail cmitchell@nsmayport.spear.navy.mil.

USS John F. Kennedy (CV-67) at NS Mayport.

For questions or comments, visit the NELP website at www.nelp.navy.mil or contact Ursula Shaw, NS Mayport NELP Coordinator, at (904) 270-6730 (DSN 960) or e-mail ushaw@nsmayport.spear.navy.mil or Mike Magee, NASNI NELP Coordinator, at (619) 524-6357 or e-mail magee.mike.h@asw.cnrsw.navy.mil.

Navy Environmental Leadership Program
Naval Station Mayport
NELP

NAVY ENVIRONMENTAL LEADERSHIP PROGRAM
NAVY REGION SOUTHWEST
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NELP INITIATIVES

- Immobilized cell bioreactor for shipboard wastewater processing
- Helicopter Gas Path Washwater Collection System
- Forced sequential rephasing
- Biocatalytic system that rapidly treats organic hydrocarbon water contaminants and converts them into organic compounds
- Helicopter Transmission Fluid Recycling System
- Motor Rewinding Varnish Dip Tank
- Graywater Treatment System
- Reclaim and treat compensated water
- Improved Stenciling/Marking System